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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,196	10/10/2006	Bernard Diem	9905/23	9203
7590 Brinks Hofer Gilson & Lione P O Box 10395 Chicago, IL 60610				
EXAMINER				
PHAM, THANHHA S				
ART UNIT		PAPER NUMBER		
2894				
MAIL DATE		DELIVERY MODE		
08/14/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/500,196

**Applicant(s)**

DIEM ET AL.

**Examiner**

Thanhha Pham

**Art Unit**

2894

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 4/23/09 and interview dated 8/11/09.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 8-18 and 20-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 19, 26 and 27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. In response to applicant's telephone inquiry on 8/11/2009 regarding the last Office action, the following corrective action is taken.

The period for reply of 3 MONTHS set in said Office Action is restarted to begin with the mailing date of this letter.

2. This Supplemental Office Action is in response to Applicant's Election dated 4/23/2009.

### ***Election/Restrictions***

3. Claims 8-18 and 20-25 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 4/23/2009.
4. Applicant's election with traverse of claims 1-7, 19 and 26-27 in the reply filed on 4/23/2009 is acknowledged. The traversal is on the ground(s) that the special technical feature of the protuberances recited in claims of group I and II satisfies the unity of the invention requirement. The argument is not found persuasive because feature of protuberances is conventional and well-known in prior art (see JP-05200539 as an evidence). The feature of the protuberances can not be considered as special technical feature for linking the two different inventions to satisfy the unity of invention

requirement. Therefore, the requirement is still deemed proper and is therefore made FINAL.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**1. Claims 1-6 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yamakawa [JP-05200539].**

► With respect to claim 1, Yamakawa (figs 1-7, text [0001]-[0033]) discloses the claimed method of sealing two substrates in a microstructure comprising the following steps:

depositing a first rim (Ti/Au, fig 6, text [0028]) onto a surface of a first substrate (5), said first rim comprising an upper rim comprising a layer of sealing material (Au) that interdiffuses spontaneously with a material of a second substrate (6) and a lower rim (Ti) comprising an adhesion material that adheres said first substrate to said sealing material;

depositing a second rim (Au, fig 6) onto a surface of at least one protuberance (protrusion) formed on said second substrate (6) facing said first rim, said second rim comprising a layer of said sealing material (Au);

bringing said upper rim and said second rim into contact (figs 5/6); and

heating said sealing material to inherently interdiffuse said sealing material and said material of said second substrate (abstract, text [0013]-[0033]).

- ▶ With respect to claim 2, said sealing material (Au) of Yamakawa and a material of said first substrate (Si) comprise materials that diffuse into each other and wherein said lower rim (Ti) inherently forms a barrier to diffusion.
- ▶ With respect to claim 3, said sealing material (Au) of Yamakawa and a material of said first substrate (Si) comprise materials that diffuse into each other and wherein said first rim further comprises a layer forming a barrier to diffusion (top portion of Ti layer) between said lower rim (lower portion of Ti later) and said upper rim.
- ▶ With respect to claim 4, Yamakawa impliedly teaches said second substrate (6) comprising silicon.
- ▶ With respect to claim 5, Yamakawa impliedly teaches said first substrate (5) comprising silicon.
- ▶ With respect to claim 6, Yamakawa teaches said sealing material comprising gold.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**2. Claims 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamakawa [JP-05200539] in view of Yoshihara et al [US 6,555,901].**

With respect to claims 26-27, Yamakawa substantially discloses the claimed method but does not expressly disclose the shape structures of surface face of said at least protuberance comprising a plurality of hollows or meshed structure.

However, Yoshihara et al (figs 2-33, cols 1-10, more particular col 3 lines 5-10) teaches using roughen surface that would comprise a plurality of hollows or meshed structure to promote Au-Si eutectic reaction for improving sealing bonding Au-Si between two substrate.

Therefore, at the time of invention, it would have been obvious for those skilled in the art to use the claimed shape structure as being claimed, per taught by Yoshihara, to improve sealing process with reason given above.

**3. Claims 7 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamakawa [JP-05200539] in view of Saito et al [JP-2001150398]**

With respect to claims 7 and 9, tungsten is a known conventional material for barrier layer used in sealing substrates in microstructure. Selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) "Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig-saw puzzle." 325 U.S. at 335, 65 USPQ at 301.

See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960) (selection of a

known plastic to make a container of a type made of plastics prior to the invention was held to be obvious).

In addition, Saito et al teaches using tungsten and titanium as equivalent and known material for barrier layer in sealing substrates.

Therefore, at the time of invention, it would have been obvious for those skilled in the art, in view of Saito et al, select and use tungsten as known material for the barrier layer in the process of Yamakawa to provide a good control in sealing process between the substrates in a microstructure.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhha Pham whose telephone number is (571) 272-1696. The examiner can normally be reached on Monday and Thursday 9:00AM - 9:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Nguyen can be reached on (571) 272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thanhha Pham/  
Primary Examiner, Art Unit 2894